REMARKS

Claims 1-21 are currently pending in the application. By this amendment, claims 1, 14 and 15 are amended and claim 21 is added for the Examiner's consideration. Support for the amendment(s) and added claim 21 is provided at pages 6 and 7 of the present specification. No new matter is added. The specification, abstract, drawings and title are also revised. Reconsideration of the rejected claims and objections in view of the above amendments and the following remarks is respectfully requested.

Objection to Drawings

In the Office Action, the drawings was objected to for several reasons as outlined at page 2 of the office action. In response:

(1) Figure 1a is revised to include the legend "prior art"; and

(2) In Figures 2-4, "IPR" is now defined in the specification as "Injection Pressure Regulator." The acronym "IPR" is a well known acronym and the addition of the definition of "IPR" in the specification, used as an example for a rail pressure regulator valve, does not add any new matter. One of ordinary skill in the art would have readily known to use such terminology.

Applicant notes that there is no requirement of submission of formal drawings during the examination of the application. The drawings, as now presented, are ample for examination purposes. The formal drawings will be provided upon allowance of the application. The formal drawings will have proper margins and lettering.

Lastly, the Examiner objects to the drawings in that they do not show multiple volumes. Applicant submits that the multiple volumes are clearly defined in the specification and that this feature would be implicit in the drawings, themselves. This feature is also shown graphically in

Figure 5, which shows the linear control of the phases of the present invention. Applicant is unsure how to represent the multiple volumes in any other manner, but will take under advisement any recommendations provided by the Examiner.

Applicant now requests withdrawal of the objection to the drawings.

Objection to Abstract

In the Office Action, the abstract of the disclosure was objected to based on its brevity. The abstract has been revised to show more structure. Also, the phrase "shot to shot" has been deleted from the abstract.

Applicant now requests withdrawal of the objection to the abstract.

Objection to Title

In the Office Action, the title of the invention was objected to for not being descriptive. The title is revised according to the Examiner's recommendation. Applicant now requests withdrawal of the objection to the title.

Objection to Specification

In the Office Action, the specification was objected to based on informalities. The specification has been revised according to the Examiner's recommendations and observations. Applicant has carefully reviewed the specification and has found several grammatical and typographical errors, which have now also been addressed, for clarity. No new matter is added.

Applicant now requests withdrawal of the objection to the specification.

35 U.S.C. §112 Rejection

In the Office Action, claims 14-17 and 19-20 were rejected under 35 U.S.C. §112, 2nd paragraph. This rejection is respectfully traversed.

Claim 14 is amended to now recite "to supply from each pump stage fluid to the injector." Claim 15 is amended to now delete the phrase " the check valves regulate ...."

Applicant further submits that the originally filed invention is directed to an apparatus; however, this amendment further adds claim 21 directed to the method of pumping fluid. As to the rejection of claims 14-17 and 19-20, Applicant submits that these claims are directed to the discharge side of the pumps. This is clarified in the amendment to claim 14. In any event, these claims were clearly within the scope of the written description when broadly read, i.e., pump stage.

Accordingly, Applicant respectfully requests that the §112, 2nd paragraph rejection.

35 U.S.C. §102 Rejections

In the Office Action, claims 1, 2, 6, 8-10 and 18 were rejected under 35 U.S.C. §102(b) over U. S. Patent No. 4,599,051 to Numazawa. Claims 1, 5 and 7 were rejected under §102(b) over U.S. Patent No. 5,199,854 to Aoyama. These rejections are respectfully traversed.

In order to reject a claim under 35 U.S.C. §102, a single prior art reference must contain each and every limitation of the claim, either expressly or under the doctrine of inherency. *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1570 (Fed. Circ), cert. denied, 488 U.S. 892 (1988). In the present rejection, Applicant submits that not all of the claim elements are present in each of the applied references.

Numazawa

The present invention is directed to at least a two stage pumping system for a fuel injector. In contrast, Numazawa only includes a single pump. In this rejection, the Examiner is of the opinion that OP2 and OP4 represent a first and second pump, respectively. Upon close inspection of this reference, though, Numazawa only shows a single rotary pump. As shown in Figure 2 and described at col. 3, the rotary pump includes

> delivery ports OP1, OP2, OP3 and OP4 [which] are connected to delivery passages 51, 52, 53 and 54 which are connected with each other at their intermediate portions to provide a common delivery passage 50 in communication with a flow control valve 40.

Thus, the Numazawa reference clearly shows only one pump, but with four outlet ports. This does not meet the elements of the claimed invention.

In addition, the Examiner is also of the opinion that V2 and V3 are valves upstream from the first and second pump. Again, it is submitted that there is only one pump. In addition, V2 and V3 are not valves which are upstream from the rotary pump. In fact, the valves V2 and V3 are associated with the inlet passages to the single pump. As described at col. 3, the valves V2 and V3 are

> a pair of electrically operated changeover valves V2 and V3 [which] are respectively disposed within the delivery passages 52 and 54 to connect them to the suction ports IP2 and IP4 through return passages 55 and 56 respectively in their energized conditions.

Applicant thus submits that Numazawa also does not show the remaining features of the independently claimed inventions of claims 1 and 8.

As to the dependent claims, Applicant submits that Numazawa does not show valves upstream from two pumps. This reference also does not show a merged line upstream from the valves, or many other features of the claimed invention.

Aoyama

Aoyama is directed to a system for an automotive suspension. In this system, the pumps 34A and 34B are designed to run simultaneously. Specifically, this system is load dependent such that when a large load or demand is required both pumps 34A and 34B will supply fluid to the system (i.e., valves 42 and 43 will not be biased to drain). In another loading example, valve 42 will be biased such that drain line 46 will merge with drain line 48 in order to drain fluid from the smaller pump 34B to drain 30. Similarly, when a load is required which is less than normally outputted from pump 34A, valve 43 will be biased such that the drain line 44 will communicate with drain 30. In this instance, a lower load generated from only pump 34A can be supplied to

the system. Thus, the valves 42 and 43 are provided to reduce the loads of either or both of the pumps; these valves are designed to adjust the demand for the system. These valves are not designed to reduce or eliminate any pressure peaks generated from the first or the second pumps. In this system, a relief valve 53 is arranged to open upon the line pressure exceeding a predetermined level. This valve is arranged to communicate with the first supply conduit 38a at a location between the first and second check valves 39A and 39B and downstream of the location where the second supply conduit 38b joins the first one. This valve is not within a first or second stage of the system. Instead, this valve is clearly on the common branch line (unlike that claimed in the present invention).

Accordingly, Applicant respectfully requests the rejection over claims be withdrawn.

35 U.S.C. §103 Rejection

In the Office Action, claims 3, 4 and 13 were rejected under 35 U.S.C. §103(a) over Numazawa in view of U.S. Patent No. 4,787,204 to Mickelson. Claims 11 and 12 were rejected under §103(a) over Numazawa. These rejections are respectfully traversed.

Applicant submits that claims 3, 4 and 11-13 are dependent from distinguishable base claims. Accordingly, claims 3, 4 and 11-13 include the distinguishing features of the respective base claims and are also in condition for allowance for the reasons set forth above.

Added Claims

Claim 21 is added for the Examiner's consideration. Claim 21 is directed to a method of eliminating or reducing the pressure peaks from the first and second pumps in a hydraulic system. Applicant submits that no prior art shows such a method.

Other Matters

The Examiner further indicated that claims 14-17 and 19-20 are not being examined at this time over any prior art due to the §112 rejection. Applicant, however, submits that independent claim 14 is distinguishable over the applied art of record. For example, claim 14

recites the use of a multiple stage pumping system having a multitude of pump stages for supplying the fluid to the injector, a feature which is clearly missing from Numazawa. Additionally, claim 14 recites a flow control system for providing a linear flow control throughout the multitude of pump stages while preventing pressure peaks, a feature which is missing from Aoyama and Numazawa.

Accordingly, Applicant submits that claim 14 and those claims dependent thereon are distinguishable over the prior art of record.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant submits that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicant hereby makes a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 23-1951.

Respectfully submitted,

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